CLAIMS

1. A suction ring for securing an ocular globe, comprising:

an upper ring section containing an aperture sized to receive and expose a cornea;

a lower ring section extendably coupled to the upper ring section;

an annular vacuum channel that is connectable to a vacuum source, wherein the annular vacuum channel has an ocular globe-engaging surface comprising an inferior engaging surface and a superior engaging surface.

2. The apparatus of claim 1, wherein the lower ring section has outer threads, wherein the upper ring section has inner threads, and wherein the lower ring section is connected to the upper ring section by mating the outer threads with the inner threads.

3. The apparatus of claim 2, wherein the lower ring section is extended in relation to the upper ring section by rotating the lower ring section in a first direction, wherein rotating the lower ring section in the first direction increases the number of mated outer and inner threads.

4. The apparatus of claim 3, wherein the lower ring section may be retracted in relation to the upper ring section by rotating the lower ring section in a second direction, wherein rotating the lower ring section in the second direction decreases the number of mated outer and inner threads.

5. The apparatus of claim 1, wherein the lower ring section has inner threads, wherein the upper ring section has outer threads, and wherein the lower ring section is connected to the upper ring section by mating the outer threads with the inner threads

6. The apparatus of claim 1, wherein the lower ring section may be extended and retracted in relation to the upper ring section, wherein retracting the lower ring section generates a

lower curvature radius for the inferior engaging surface and wherein extending the lower ring section generates a higher curvature radius for the inferior engaging surface.

7. The apparatus of claim 1, wherein the aperture is a shape selected from the group consisting of circular, elliptical, oval, and ovoid.

8. The apparatus of claim 1, wherein the inferior engaging surface and the superior engaging surface are defined by a plurality of meridians having different radii.

9. The apparatus of claim 1, wherein the inferior engaging surface and the superior engaging surface are defined by a plurality of meridians having equal radii.

10. The apparatus of claim 1, wherein the inferior and superior engaging surfaces each has a shape selected from the group consisting of circular, elliptical, oval, ovoid and combinations thereof.

11. The apparatus of claim 1, wherein the suction ring is made from a material selected from the group consisting of stainless steel, titanium, synthetic plastic, rubber and combinations thereof.

12. A microkeratome for performing a lamellar keratotomy of an aspherical ocular globe, comprising:

a suction ring comprising an upper ring section containing an aperture sized to receive and expose a cornea, a lower ring section extendably coupled to the upper ring section, an annular vacuum channel that is connectable to a vacuum source, wherein the annular vacuum channel has an ocular globe-engaging surface comprising an inferior engaging surface and a superior engaging surface;

a blade suitable for corneal resections;

a cutting head for carrying the blade over the suction ring through a cutting path defined by the suction ring;

an adjustable cornea compression device connected to the cutting head for at least partially compressing the cornea ahead of the blade so as to set the corneal resection to a desired shape and thickness;

means for driving the cutting head and the cornea compression device across the suction ring.

13. The microkeratome of claim 12, wherein the lower ring section has outer threads, wherein the upper ring section has inner threads, and wherein the lower ring section is connected to the upper ring section by mating the outer threads with the inner threads.

14. The microkeratome of claim 13, wherein the lower ring section is extended in relation to the upper ring section by rotating the lower ring section in a first direction, wherein rotating the lower ring section in the first direction increases the number of mated outer and inner threads.

15. The microkeratome of claim 14, wherein the lower ring section may be retracted in relation to the upper ring section by rotating the lower ring section in a second direction, wherein rotating the lower ring section in the second direction decreases the number of mated outer and inner threads.

16. The microkeratome of claim 12, wherein the lower ring section has inner threads, wherein the upper ring section has outer threads, and wherein the lower ring section is connected to the upper ring section by mating the outer threads with the inner threads.

17. The microkeratome of claim 12, wherein the lower ring section may be extended and retracted in relation to the upper ring section, wherein retracting the lower ring section generates a lower curvature radius for the inferior engaging surface and wherein extending the lower ring section generates a higher curvature radius for the inferior engaging surface.

18. The microkeratome of claim 12, wherein the aperture is a shape selected from the group consisting of circular, elliptical, oval, and ovoid.

19. The microkeratome of claim 12, wherein the inferior engaging surface and the superior engaging surface are defined by a plurality of meridians having different radii.

20. The microkeratome of claim 12, wherein the inferior engaging surface and the superior engaging surface are defined by a plurality of meridians having equal radii.

21. The microkeratome of claim 12, wherein the inferior and superior engaging surfaces each has a shape selected from the group consisting of circular, elliptical, oval, ovoid and combinations thereof.

22. The microkeratome of claim 12, wherein the suction ring is made from a material selected from the group consisting of stainless steel, titanium, synthetic plastic, rubber and combinations thereof.

23. The microkeratome of claim 12, wherein the cutting path is horizontal.

24. The microkeratome of claim 12, wherein the cutting path is pendular.